their high cost. Or, alternatively, a more sophisticated attempt at identifying cost drivers could be attempted. The regressions used to establish the differential could then be re-estimated.

III. ALTERNATE APPROACHES TO ESTABLISHING THE BENCHMARK DO NOT SUPPORT LARGER RATE REDUCTIONS

As discussed above, the econometric analysis in support of the existing 10 percent reduction is weak. Even if the econometric case were strong, it would be appropriate to look at confirming evidence from other sources or approaches before adopting benchmark rates. But the case for changing the benchmark rate is eroded even further by the fact that alternate approaches do not support a 28 percent reduction.

This point can be illustrated by reference to the methodology advocated by the Consumer Federation of America (CFA).[12] The CFA suggested a "Global Formulaic Approach." Under the Global Formulaic, a benchmark was established by escalating rates in effect at the time of deregulation by an inflation index. This result was then compared with alternate methodologies as a check on the validity of the estimate. The alternatives used as a check were a comparison of rates from competitive systems and a simple projection of historical trends on a rate per channel basis.[13]

Using its methodology, the CFA argued that rates should be reduced by approximately the same amount they would be reduced if the Commission eliminates the low penetration

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[12] See Comments of CFA, January 27, 1993.

[13] *Id.* at 102

systems from the competitive sample.[14] However, as many parties noted, the particular methodologies used by the CFA were flawed, or at best, significantly biased.[15] Therefore, confirming evidence for changing the current benchmark is lacking. Of course, given the problems with the Commission's benchmark discussed above, even the existing rate cut is questionable.

The principal problem with the CFA analysis is that it ignores quality increases since the end of regulation in 1986. Increases in cable subscription fees have exceeded the rate of inflation in the economy generally. However, for a proper comparison, rates must be adjusted for the quantity and quality of programming available and for improvement in signal quality and reliability.[16] The CFA failed to include the effect of the substantial programming cost increases since 1986 in its analysis.[17] Moreover, by escalating the average basic rate per subscriber in 1986 and then dividing by the number of channels in 1992 to come up with a per channel rate, the CFA effectively ignored all of the costs of providing additional

providing extra channels, the incremental cost of doing so is surely positive and should be included in a proper analysis.

There are similar problems with the alternate approaches that allegedly provide confirming evidence for the Global Formulaic projections. As discussed above, the competitive system benchmark is likely flawed due to the inclusion of firms in disequilibrium.[18] The simple projection of the historical rate of per channel price change is also flawed. Dramatic increases in satellite networks and in programming costs after deregulation imply that, from the point of view of programming, operators were adding more expensive channels. Moreover, economies of scale typically fall as output rises. In other words, the benefits in cost per channel of adding 10 channels to a 10 channel system are greater than the benefits of adding 10 channels to a 20 channel system.[19]

The data to make all of the adjustments discussed here are simply unavailable. However, it is obvious that the CFA analysis is off by a wide margin. The conclusion is that alternate methodologies do not support further rate reductions.

IV. FURTHER RATE REDUCTIONS CAN HARM CONSUMER WELFARE

As discussed above, quality is an important dimension of cable industry performance. Consumers have responded to improvements in quality by subscribing to the service and

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[18] The CFA itself recognized the problems with the competitive firm benchmark. See Comments of CFA, *supra*, note 12, p. 84.

[19] The CFA makes the same basic mistake in criticizing the cable industry's excellent performance in terms of expanding capacity and attracting customers since deregulation. See CFA Reply Comments, p. 87-89. Percentage improvement was much easier to obtain in the pre-deregulation period when the base of subscribers was much smaller.

viewing the programming. Excessive regulation may create incentives for cable operators to reduce quality of service.

Cable companies are managed to create value for shareholders. This is the proper goal of all firms in a market economy. Faced with a new set of rules, cable operators will optimize their operations to achieve their goals. Faced with regulations that do not allow reasonable profits, firms are likely to reduce their investment in quality programming for basic cable or cable programming services. Consumer welfare will suffer as a result.

This response to regulation is not an "evasion." It is impossible, and undesirable, for government to legislate against profit-maximizing firms acting on all of the incentives that make markets work.[20] The choice of programming inputs is an inherently subjective process. The detailed and complicated oversight of programming inputs recommended by the CFA demonstrates the problems with embarking on this path.[21] The Commission should not exacerbate these problems by tightening regulation when it cannot be sure that it has not already gone too far.

In general, the greater the rate reduction, the more effort management must expend to react to its effects. Therefore, in addition to negative effects on programming quality, an excessive regulatory constraint may harm consumers by diverting valuable management resources from the job of positioning cable to compete in evolving telecommunications

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[20] The problems with quality regulation have been less severe in the regulated telephone sector. First, rate of return regulation has, if anything, created a bias towards excessive capital investment. Second, it is easier to measure the quality dimension in the telephone business.

[21] See Comments of CFA, January 27, 1993, *supra* note 12, pp. 94-100.

businesses. They will instead devote resources to reorganizing their firms to react to regulatory requirements and incentives.

The cable industry has been investing substantial amounts of dollars in modernizing its plant to improve signal quality and capacity and to provide the capability to offer new video and other telecommunications services. Reductions to operating margins of the magnitude under discussion in the Further Notice could reduce the flow of resources into the industry and potentially jeopardize some of this investment, with consequent negative spillover effects on businesses adjacent to the cable industry.[22]

There is an additional indirect, but potentially large, negative incentive effect of further adjustments to the benchmark. As discussed above, lower benchmark rates will result in more companies operating under the incentives created by rate of return regulation. This will lead to inefficient use of resources because rate of return regulated cable firms will have the incentive to overinvest in capital and programming inputs. Cable regulation could lead to two very different types of firms -- those that underspend in response to the benchmarks and those that overspend in response to rate of return regulation. A reduction in economic efficiency will be the common element.

V. FURTHER RATE REDUCTIONS WILL EXACERBATE COMMISSION RESOURCE SHORTAGES

Even with a 10 percent reduction, there will likely be rate cases filed with local and federal regulators. It is axiomatic that larger rate cuts will lead to more rate cases. These cases will be costly in terms of both time and money. Cable companies, local regulators and

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[22] See "Economics of Cable Television Regulation," *supra*, note 1, p. 5.

the Commission will bear the costs directly as they commit resources to the regulatory process. Consumers will ultimately bear those costs. The cost of regulation incurred by cable companies will ultimately be recovered from consumers through rates. The cost of enforcing the regulations will be borne by taxpayers. Moreover, it seems reasonable to assume that in many cases the cable operators will succeed in demonstrating that rates should not be reduced to benchmark levels. In those cases, consumers may not see rate reductions, but the additional regulatory costs will still have been incurred.

VI. CONCLUSION

Further rate reductions are not justified. There is little or no econometric support for the 10 percent reduction. The steps required to derive further reductions from the benchmark methodology would undermine what support there is. There is no valid evidence from other benchmark approaches to validate the 28 percent reduction. Unsupported rate reductions will likely cause financial harm to the industry, create incentives to reduce quality and divert management resources. Finally, a larger rate reduction will certainly lead to more rate cases, with consequent costs to regulators, firms and consumers.

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ECONOMETRIC ANALYSIS OF THE FCC'S PROPOSED COMPETITIVE BENCHMARKS

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I. INTRODUCTION

The FCC is considering eliminating franchises with under 30 percent penetration from the competitive benchmark. According to the Commission, this would change the price reduction for "noncompetitive" systems from 10 percent to 28 percent. In part this determination will be made on an assessment of what is an economically appropriate measure of competition. But, the determination also raises econometric and statistical issues[1]. In this study we examine the broader and narrower measures of competition (i.e., with and without the low-penetration franchises) to determine which one provides a more stable and reliable measure of the competitive effect.

We have found that the competitive effect as measured by the FCC's model is not stable across franchises, particularly when the narrower definition of competition is used. Any effort to account for these instabilities leads either to:

(1) adoption of the broader measure of competition; or

(2) an average estimate from the narrower competition measure which is similar to the 10 percent adjustment ascribed by the FCC to the broader measure.

In either case, our results suggest that the FCC's original estimate of competitive effect (or a lower value) is the more appropriate choice.

Before proceeding to our specific results, we note that the FCC released the data upon which it based its regression (and a corrected version of these data) only within the last two weeks. In this extremely short time, it has not been possible to explore fully all of the issues we raise here.

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[1] Indeed, the FCC's consideration of the narrower competitive benchmark appears to be motivated, at least in part, by econometric results. After noting the different coefficients and significance levels on separate dummy variables for franchises with less than 30 percent penetration and the other two components of the original competitive benchmark, the Commission concluded, "Community units with less than 30 percent penetration clearly behave very differently from the community units that face competition from other multichannel providers." *Order*, Appendix E, Par. 30

II. INSTABILITY OF THE COMPETITIVE EFFECT

According to the FCC, the effect of competition is a 10 percent reduction in the price per channel when the broader definition is used or a 28 percent reduction when the narrower definition is used. Implicit in the FCC method is that this value is constant across systems. Statistical techniques, however, reject the notion that these effects are constant—the coefficients of the estimated model vary significantly. We have found two significant inhomogeneities, both of which carry the implication that the effect of competition varies widely across systems. First, franchises in large systems (those with 10,000 or more subscribers) and small systems (under 10,000 subscribers) behave quite differently in the way the price per channel of each group is related to subscribers, number of channels and satellite channels and in the competitive effect. Second, for the narrower measure, competitive and "noncompetitive" firms have quite different determinants of price per channel, i.e., the effects of subscribers and channels are different for the narrower competitive group than for the rest of the sample.[2]

The inhomogeneity of the model with respect to system size is particularly important in the estimated effect of competition. Large systems have relatively small competitive effects, while small systems have much larger competitive effects. Using the broader competitive definition, large systems have a 3 percent competitive effect, while small systems have a 17 percent effect. Using the narrower definition of competition, large systems have a competitive effect of 9 percent, while small systems have an effect of 38 percent.[3] Under the narrower definition of competition, there is a greater disparity in the coefficients of both groups. Since the large systems serve 78 percent of cable

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[2] Using standard Chow tests, homogeneity with respect to size when the sample is divided into systems above and below 10,000 subscribers is rejected at the 98 percent level. Homogeneity of the narrower competitive group versus all regulated firms is rejected at the 90 percent level. By contrast, the broader competitive group passes the test for homogeneity at the 75 percent level. See Appendix, Tables 1-4.

[3] See Appendix, Tables 1 and 2.

customers,[4] the average effect of each measure is less than the effect estimated for the whole sample by the FCC.

The rejection of homogeneity for the narrower competitive group and the remainder of the sample also suggests that the competitive effect varies substantially across the sample. Either the broader competitive group (which does not suffer from this problem) should be used or a more complex structural model should be developed.

III. ADJUSTING FOR INSTABILITY

There are three solutions for the instability of the effect of competition in this model. The first is simply to assign each franchise its own competitive effect as specified in the model.[5] For example, franchises in systems with more than 10,000 subscribers will have a 3 percent reduction in prices above their benchmark if the broader measure is used and a 9 percent reduction if the narrower measure is used, based on the results described above. Should this route be pursued, it seems clear that the average effect of using the narrower competitive definition will be far lower than the FCC's proposed 28 percent.

The second solution is to acknowledge that the effect varies from franchise to franchise but to attempt to create an average effect which correctly reflects the population as a whole. This can be accomplished by using the FCC's model, but weighting the observations by the number of subscribers in the system. In this way, divergences between actual and predicted prices per channel for franchises which are in systems with larger numbers of subscribers will receive correspondingly more weight. The unweighted FCC method does not make this adjustment. As a result, systems

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[4] *Television and Cable Factbook*, 1992 Edition, Cable and Services Volume, p. G-65.

[5] If this type of approach is adopted, more research into sample homogeneity with respect to competitive effects is warranted. While we have found one obvious instability based on size, there may be others based on other system characteristics. Further, additional size divisions may be optimal.

under 200 subscribers (13 percent of the sample) which represent only 1 percent of cable subscribers have as much weight in the FCC benchmark as systems over 50,000 subscribers (also 13 percent of the sample) which represent 40 percent of cable subscribers.[6]

The effect of this weighted method is to drop the competitive effect to 3 percent for the broader competitive measure and to 7 percent for the narrower competition measure.[7] While both competitive coefficients change from those estimated in the original FCC model, the change is less for the broader competitive measure. Again, this correction produces average rate reductions very much lower than the 28 percent derived by the Commission for the narrower measure.

The third solution is to ignore the size homogeneity problem and not make any adjustments. If this approach is adopted, the broader competition definition, which passes the test for homogeneity of channel and subscriber coefficients using the FCC model, is the preferred specification of competitive effect. If the Commission is committed to one or the other of its two estimates, the broader competition definition is superior on purely statistical grounds.

IV. GENERAL CAUSES OF INSTABILITY

We have examined only the instability that results from problems with the specification of the model, specifically, lack of homogeneity across system size and regulatory status. In this section we discuss other possible causes of instability in the model's measurement of competitive effect.

At least in principle, econometric estimation is quite capable of determining the price (or price per channel) charged by cable franchises. Once we have a good model of price, the procedure employed by the FCC, namely assuming that any residual mean differences in price for competitive

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[6] *Television and Cable Factbook*, p. G-65.

[7] See Appendix, Tables 5 and 6.

systems are attributable to that competition, is a sound one, but it depends crucially on the assumption that we have a good model in the first place. If we do not, we will inevitably confound model fitting problems with the effects of competition and attribute to competition a net effect (positive or negative) which it does not have.[8]

The criteria for a good model include (but are not limited to):

1. accuracy of the data;
2. use of independent variables which cause the dependent variable; and
3. correct specification of functional form of those variables.

We have listed these not in their order of importance, but in a stylized order in which an applied researcher normally goes about the formation of a new model. Consideration in this order makes the entire process more understandable.

A. Accuracy of the Data

It is impossible to create an accurate model if the data are inaccurate. Of course, no data set is perfect and random errors will simply increase the unreliability of the model without biasing any coefficients. Nonetheless, where data errors can be corrected, they should be, before possibly spurious results become the basis for public policy. Occasionally, errors may adventitiously create significance where none, in fact, exists. In general, they will move coefficients. While these coefficients will be unbiased, they will be less accurate than they should be.

At least three categories of data problems have been found in the model:[9]

1. Some franchises apparently had the number of channels misstated.

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[8] There is substantial unexplained variance in this model, especially when we consider that the independent variables (particularly number of channels) explain price per channel much better than they explain price. When any mean differences are attributed to competition, substantial unexplained variance gives omitted or misspecified factors more of an opportunity to be mistaken for a competitive difference.

[9] We have identified ten observations that fall into the first two categories. See Appendix, Note.

2. Other franchises had extremely high equipment quantities relative to basic subscribers. If these are not simply errors, they may reflect unusual cost circumstances, as with a new system which must bear installation costs for each subscriber.
3. Some of the price adjustments for equipment were questionable. For example, installation revenues were assumed to be equal to the stated installation price times the installations in that year although some may have been discounted or even free.

These errors are surely not exhaustive, and we have not examined the NCTA's submission of corrected data or other errors discovered by the FCC Staff which remain uncorrected.[10] If those corrections are in fact accurate, there is no excuse not to make them.

B. Selection of Independent Variables

Price is determined by two factors: marginal cost and demand elasticity. Thus, all of the variables employed by the modeler should have some plausible connection to one or the other of these factors. Indeed, the three variables chosen by the FCC (channels, satellite channels, and subscribers) are all partial determinants of marginal cost and/or demand conditions; hence, they are logically included in the model.

No one, however, would claim that these variables purport to completely describe costs or demand. Among the variables which are not considered are: (1) the number of PEG channels; (2) density of the cable area (which should be more expensive in both sparse and dense areas); (3)

[10] *Order*, Appendix E., p. 6, footnote 11.

percentage of bad debts; (4) percent of underground distribution plant; and (5) equipment quantities.[11]

Failure to include an independent variable which affects the dependent variable is not necessarily fatal. As long as the omitted variables are uncorrelated with the other terms in the model, in fact, it is no problem at all. It is, however, quite problematical in a model which purports to attribute all changes other than those explicitly measured to competition. At this point, we do not know nearly enough about the competitive franchises to know whether they differ in respect of important unmeasured characteristics which are in fact cost-causative.

C. Functional Form

Having settled on a particular set of variables which cause costs, we can next examine how best to use those variables. The tension in this part of the analysis is between parsimony and accuracy. The log specification employed by the FCC is the most parsimonious. Investigations have indicated that it is not the most accurate.

Consider the effect of the reciprocal of subscribers. The FCC specification implies that every increase in subscribers leads to a lower cost per channel (though for large systems this effect is quite small). Presumably this is an economy of scale effect in the provision of service. The total effect of the change from systems with under 1,000 subscribers to systems with over 10,000 subscribers is about 2 percent, i.e. all things equal, very small systems charge about 2 percent more per channel. These relative effects are forced on the model by the functional form employed.

We reestimated the model for two different size groups, under 1,000 and over 10,000 subscribers. When we allow each of the size groupings to have whatever effect the data prescribes,

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[11] While the FCC cites density and underground plant as variables which "either were not statistically significant or were not consistently so" (*Order*, Appendix E, ¶27), the effects of these variables depend on the specification of the model. With a "correct" specification, all well-measured variables known to be important to price should prove at least to have effects with the proper sign and might justifiably be included to add precision to the competitive effect variable, even if their individual significance is nominal.

the results are different. In this case, the sign of the effect changes in large systems.[12] Now among systems with 10,000 subscribers there are diseconomies of scale. Increases in subscribers lead to higher, not lower costs.

So long as there is enough variation to separate statistically the effects of various groupings of the data, the model should not force the data to fit an inaccurate functional form. Before firm conclusions are drawn about competitive effects, more work in functional form for the subscriber and channel effects is in order.

V. CONCLUSION

Our research to date indicates that the competitive effect in the FCC model varies by system size. This is particularly important because most cable subscribers are found in large systems which make up a relatively small part of the sample. The broader competitive benchmark is less affected by this problem than the narrower benchmark. Further, when low-penetration systems are omitted from the benchmark and corrections are made to account for this problem we get average competitive effects dramatically lower than the 28 percent the FCC estimated for the narrower competitive benchmark.

Our preliminary work also suggests that there are other problems with the FCC model: inaccurate data, omitted variables and incorrect functional form. These may also affect the

APPENDIX

NOTE

APPARENT ERRORS IN FCC DATA
BY FRANCHISE CODE

AL0432	Incorrect number of channels due to nested tiers.
AZ0213	Extremely high equipment quantities relative to subscribers.
CA1294	Extremely high equipment quantities relative to subscribers.
FL1026	Incorrect number of channels due to nested tiers.
IL0448	Incorrect number of channels due to nested tiers.
MO0132	Extremely high equipment quantities relative to subscribers.
NY1280	Incorrect number of channels due to nested tiers.
TX0762	Conflicting numbers of channels.
WI0254	Incorrect tier prices due to nested tiers.
XX0024	Extremely high equipment quantities relative to subscribers.

Note: All of the results shown in the following tables exclude these data points.

TABLE 1

Chow Test
Systems Above and Below 10,000 Subscribers
FCC Model Using Broader Competition Definition

Source	SS	df	MS		
Model	42.6948591	9	4.74387323	Number of obs =	367
Residual	12.1857291	357	.034133695	F(9, 357) =	138.98
Total	54.8805882	366	.149946962	Prob > F =	0.0000
				R-square =	0.7780
				Adj R-square =	0.7724
				Root MSE =	.18475

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_cons	2.60097	.1289331	20.173	0.000	2.347406	2.854534
below10						
1	.3409621	.3235918	1.054	0.293	-.2954236	.9773479
2	(dropped)					
recipsub*below10						
1	-1158.607	721.1847	-1.607	0.109	-2576.912	259.6969
2	7.226303	1.984506	3.641	0.000	3.323512	11.12909
lnchan*below10						
1	-.9761189	.1462943	-6.672	0.000	-1.263826	-.6884119
2	-.8726879	.0564369	-15.463	0.000	-.9836784	-.7616974
lnsat*below10						
1	.0515697	.1270848	0.406	0.685	-.1983592	.3014986
2	.0211242	.0364301	0.580	0.562	-.0505203	.0927688
abc*below10						
1	-.0281077	.037718	-0.745	0.457	-.1022851	.0460698
2	-.1705383	.0272657	-6.255	0.000	-.2241598	-.1169168

Test

(1) recipsub*below10[1] - recipsub*below10[2] = 0.0
(2) abc*below10[1] - abc*below10[2] = 0.0
(3) lnchan*below10[1] - lnchan*below10[2] = 0.0
(4) lnsat*below10[1] - lnsat*below10[2] = 0.0

F(4, 357) = 3.06
Prob > F = 0.0168

Note:
Lines 1 represent systems with subscribers of 10,000 and above.
Lines 2 represent systems with subscribers below 10,000.

Chow Test
Systems Above and Below 10,000 Subscribers
FCC Model Using Narrower Competition Definition

Source	SS	df	MS		
Model	44.628122	11	4.057102	Number of obs =	367
Residual	10.2524662	355	.028880187	F(11, 355) =	140.48
Total	54.8805882	366	.149946962	Prob > F =	0.0000
				R-square =	0.8132
				Adj R-square =	0.8074
				Root MSE =	.16994

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_cons	2.282913	.1251853	18.236	0.000	2.036715	2.529111
below10						
1	.6620179	.3003398	2.204	0.028	.0713491	1.252687
2	(dropped)					
adummy*below10						
1	.0290184	.0450332	0.644	0.520	-.0595471	.1175839
2	-.0206747	.0313942	-0.659	0.511	-.0824166	.0410673
bcdummy*below10						
1	-.087605	.0458023	-1.913	0.057	-.1776829	.0024729
2	-.3806443	.0364679	-10.438	0.000	-.4523646	-.3089241
lnchan*below10						
1	-1.028112	.1370798	-7.500	0.000	-1.297703	-.7585215
2	-.7827737	.0531344	-14.732	0.000	-.8872714	-.6782759
lnsat*below10						
1	.1110849	.1206628	0.921	0.358	-.1262189	.3483887
2	.0337102	.0335471	1.005	0.316	-.0322658	.0996861
recipsub*below10						
1	-1190.454	663.5616	-1.794	0.074	-2495.46	114.5517
2	6.94275	1.825761	3.803	0.000	3.352083	10.53342

Test

(1) recipsub*below10[1] - recipsub*below10[2] = 0.0
(2) adummy*below10[1] - adummy*below10[2] = 0.0
(3) bcdummy*below10[1] - bcdummy*below10[2] = 0.0
(4) lnchan*below10[1] - lnchan*below10[2] = 0.0
(5) lnsat*below10[1] - lnsat*below10[2] = 0.0

F(5, 355) = 5.89
Prob > F = 0.0000

Note:
Lines 1 represent systems with subscribers of 10,000 and above.
Lines 2 represent systems with subscribers below 10,000.

Chow Test
Competitive and Regulated Franchises
FCC Model Using Broader Competition Definition

Source	SS	df	MS		
Model	42.1797823	7	6.02568318	Number of obs =	367
Residual	12.7008059	359	.035378289	F(7, 359) =	170.32
Total	54.8805882	366	.149946962	Prob > F =	0.0000
				R-square =	0.7686
				Adj R-square =	0.7641
				Root MSE =	.18809

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_cons	2.502894	.1955882	12.797	0.000	2.118252	2.887537
abc						
1	-.0899655	.2365564	-0.380	0.704	-.5551758	.3752448
2	(dropped)					
lnchan*abc						
1	-.8149157	.0572156	-14.243	0.000	-.9274356	-.7023958
2	-.7947535	.1189668	-6.680	0.000	-1.028713	-.560794
lnsat*abc						
1	.0240309	.0377876	0.636	0.525	-.0502819	.0983438
2	-.0747027	.1007649	-0.741	0.459	-.2728664	.123461
recipsub*abc						
1	5.036922	3.110022	1.620	0.106	-1.079228	11.15307
2	5.156668	2.704708	1.907	0.057	-.1623951	10.47573

Test

(1) recipsub*abc[1] - recipsub*abc[2] = 0.0
(2) lnchan*abc[1] - lnchan*abc[2] = 0.0
(3) lnsat*abc[1] - lnsat*abc[2] = 0.0

F(3, 359) = 1.25
Prob > F = 0.2915

Note:
Lines 1 represent regulated franchises.
Lines 2 represent competitive franchises including those with less than 30 percent penetration.

TABLE 4

Chow Test
Competitive and Regulated Franchises
FCC Model Using Narrower Competition Definition

Source	SS	df	MS		
Model	33.7703591	7	4.82433702	Number of obs =	307
Residual	9.32213664	299	.031177715	F(7, 299) =	154.74
				Prob > F =	0.0000
				R-square =	0.7837
				Adj R-square =	0.7786
Total	43.0924958	306	.14082515	Root MSE =	.17657

TABLE 5

Weighted Regression
FCC Model Using Broader Competition Definition

Source	SS	df	MS		
Model	13.3528721	4	3.33821801	Number of obs =	367
Residual	7.60710352	362	.021014098	F(4, 362) =	158.86
Total	20.9599756	366	.057267693	Prob > F =	0.0000
				R-square =	0.6371
				Adj R-square =	0.6331
				Root MSE =	.14496

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
abc	-.0255976	.0167933	-1.524	0.128	-.0586224	.0074271
recipsub	-2.531738	23.45309	-0.108	0.914	-48.65315	43.58968
lnchan	-.925802	.0564878	-16.389	0.000	-1.036888	-.8147166
lnsat	.1001322	.0474411	2.111	0.035	.0068374	.1934271
_cons	2.561027	.1241808	20.623	0.000	2.316821	2.805233

Note:
Weights are system subscribers.

TABLE 6

Weighted Regression
FCC Model Using Narrower Competition Definition

Source	SS	df	MS	Number of obs =	367
				F(5, 361) =	130.74
Model	13.5032032	5	2.70064063	Prob > F =	0.0000
Residual	7.4567724	361	.020655879	R-square =	0.6442
				Adj R-square =	0.6393
Total	20.9599756	366	.057267693	Root MSE =	.14372

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adummy	.005872	.0203294	0.289	0.773	-.0341069	.0458508
bcdummy	-.0729123	.0241828	-3.015	0.003	-.1204692	-.0253554
recipsub	-.4060216	23.26568	-0.017	0.986	-46.15931	45.34727
lnchan	-.9307324	.0560341	-16.610	0.000	-1.040927	-.8205382
lnsat	.1192025	.0475633	2.506	0.013	.0256666	.2127384
_cons	2.51996	.1240554	20.313	0.000	2.275998	2.763922

Note:
Weights are system subscribers.

TABLE 7

FCC Model Using Broader Competition
For Two Subscriber Size Groups

Systems with 10,000 or More Subscribers

Source	SS	df	MS		
Model	5.43291762	4	1.3582294	Number of obs =	126
Residual	2.85079583	121	.023560296	F(4, 121) =	57.65
Total	8.28371345	125	.066269708	Prob > F =	0.0000
				R-square =	0.6559
				Adj R-square =	0.6445
				Root MSE =	.15349

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
abc	-.0281077	.0313363	-0.897	0.372	-.0901461	.0339308
recipsub	-1158.607	599.1633	-1.934	0.055	-2344.809	27.59441
lnchan	-.9761189	.121542	-8.031	0.000	-1.216743	-.7354945
lngat	.0515697	.1055826	0.488	0.626	-.1574589	.2605983

FCC Model Using Narrower Competition Group
For Two Subscriber Size Groups

Systems with 10,000 or More Subscribers

Source	SS	df	MS		
Model	5.54725314	5	1.10945063	Number of obs =	126
Residual	2.7364603	120	.022803836	F(5, 120) =	48.65
Total	8.28371345	125	.066269708	Prob > F =	0.0000
				R-square =	0.6697
				Adj R-square =	0.6559
				Root MSE =	.15101

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adummy	.0290184	.0400163	0.725	0.470	-.0502111	.1082479
bcdummy	-.087605	.0406997	-2.152	0.033	-.1681875	-.0070225
recipsub	-1190.454	589.6376	-2.019	0.046	-2357.896	-23.01269
lnchan	-1.028112	.1218085	-8.440	0.000	-1.269285	-.7869399
lnsat	.1110849	.1072204	1.036	0.302	-.101204	.3233739
_cons	2.944931	.2425924	12.139	0.000	2.464615	3.425247

Systems with Fewer than 1,000 Subscribers

Source	SS	df	MS		
Model	13.7329144	5	2.74658287	Number of obs =	121
Residual	4.1690131	115	.036252288	F(5, 115) =	75.76
Total	17.9019275	120	.149182729	Prob > F =	0.0000
				R-square =	0.7671
				Adj R-square =	0.7570
				Root MSE =	.1904

lnp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
adummy	-.0602986	.0425987	-1.416	0.160	-.1446785	.0240813
bcdummy	-.3824623	.0611999	-6.249	0.000	-.5036875	-.2612372
recipsub	7.260376	2.200877	3.299	0.001	2.900862	11.61989
lnchan	-.944282	.1059754	-8.910	0.000	-1.154199	-.7343651
lnsat	.1265976	.0699852	1.809	0.073	-.0120297	.2652249
_cons	2.548211	.2103498	12.114	0.000	2.131549	2.964873